

AFIT/GLM/LAC/97S-2

**AN ANALYSIS OF
TACTICAL MILITARY AIRLIFT**

THESIS

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AN ANALYSIS OF TACTICAL MILITARY AIRLIFT
THESIS

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Preface

The purpose of this research is to draw attention to the subject of tactical military airlift. Strategic military airlift has been the subject of much study, but the importance of tactical military airlift is often overlooked. The attitude seems to be that if a nation is capable of successful strategic military airlift, it automatically becomes capable of successful tactical military airlift. Uncoordinated tactical military airlift efforts can result from this attitude.

Military history provides many examples of the use of tactical military airlift. Three particular examples are Stalingrad, Dienbienphu, and Khe Sanh. These battles occurred within a fifty year period, and the outcome of each had major political impacts. The implication is that modern warfare tends to create situations that require the use of tactical military airlift.

Closure of American military bases overseas and force drawdowns could result in American forces deploying from the CONUS to regions with little if any American military infrastructure. This possibility adds to the likelihood of tactical military airlift operations in the future.

The possibility of future operations under similar conditions makes tactical military airlift operations an important topic for military thought and discussion. This research was conducted to stimulate such thought and discussion in the hope that positive doctrine for tactical military airlift operations will be the outcome.

It would be impossible to thank individually all the people who made this research possible. With sincere gratitude I thank each of them, family, friends, and faculty.

However, there are some who deserve special acknowledgment for their impact on my life and thereby, my opportunity to conduct this research.

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I owe special recognition to my parents, Louis and Pam Donoho. They took the time to teach me the importance of education, and they instilled in me the belief that I could achieve anything I set my mind to. They have been there for me in the good times as well as the bad times. I would be lost without their love and support. Thanks Dad and Mom.

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Haley Donoho

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Abstract

This study examines tactical military airlift operations conducted during three historical battles – Stalingrad, Dienbienphu, and Khe Sanh. Aspects of tactical military airlift operations are identified from these scenarios. The list of important issues that results can be considered when employing tactical military airlift in the future.

Using inductive reasoning, tactical military airlift operations in each scenario, and their success or failure, are examined to develop a pattern for recognizing and describing similar situations in the future. Experiences at Stalingrad, Dienbienphu, and Khe Sanh indicated that there are nine elements that should be considered when employing tactical military airlift. Those elements are command and control, aircraft availability and capabilities, technology, location and weather, logistical requirements, support and defense intelligence gathering, training, and political considerations. Command and control, aircraft availability and capabilities, support and defense, and intelligence gathering are identified as crucial elements for success in tactical military airlift operations. The remaining five elements may have an impact on the crucial elements.

Historical experience at Stalingrad, Dienbienphu, and Khe Sanh indicate that successful application of simple concepts is not automatically achieved. Recognition of the crucial elements and their secondary elements is important to the future of tactical military airlift operations.

AN ANALYSIS OF TACTICAL MILITARY AIRLIFT

I. Introduction

Military history indicates that the availability of logistical capability is strongly correlated with the potential for victory or defeat. Modern military logistics involves the production and transportation of massive quantities of various types of war materials to the war zone. Recent political changes around the globe and their effects on the American political system have the potential to seriously impact the manner in which the United States Air Force carries out its mission of global engagement. This thesis is concerned with the conduct of tactical airlift operations in geographically isolated areas under hostile conditions.

Background

Airlift is the movement of people and resources to the right place at the right time. Organizing, training, and equipping airlift forces has been an evolving science since the 1920s. Current US military doctrine calls for the quick response of airlift to meet many of the needs encountered in the opening phases of conflict. This is followed by sealift and ground transport as necessary. The system worked very well during the Desert War. Supply lines, though long, were very definite, and the enemy did not interfere with airlift operations.

Unfortunately, these ideal conditions are not always available. History reflects many situations where airlift was called upon to maintain forces in remote, hostile locations. Examples of such situations can be found as far back as World War I, when an American unit, the 2nd Battalion of the 308th infantry, was cut off and surrounded by the Germans. This unit, known as the "Lost Battalion," was supported by the 50th Aero Squadron for three days before it was rescued (Morse, 1990: 52). An estimated 1000 pounds of supplies were dropped by thirteen planes during this crisis (Morse, 1990: 49).

Three similar situations are noted for the impact they have had on airlift. These are the siege of Stalingrad in 1942, the siege of Dien Bien Phu in 1954, and the siege of Khe Sanh in 1968.

At Stalingrad, a quarter of a million German and Rumanian troops commanded by General Friedrich von Paulus were trapped by the Soviet Army (Mason, 1973). Adolf Hitler asked Herman Goering if the Luftwaffe could adequately provision the Sixth Army until reinforcements could reach them. Goering assured Hitler that it could be done. According to the Wehrmacht Chief of Staff, General Zeitzler, the Sixth army's minimum daily requirement was four hundred tons of supplies of which the Luftwaffe averaged ninety-four tons daily before the battle ended nearly three months later (Mason, 1973: 367). Stalingrad was an airlift disaster. The Sixth Army was marched off to captivity with its commander, now Field Marshal, von Paulus. The Luftwaffe lost 488 aircraft and 1000 air crew members in this debacle (Mason, 1973: 367).

At Dien Bien Phu, in Indo-china's northern mountain area, a large French garrison was assigned to guarantee free usage of the airfield and to inflict heavy losses on the enemy if they attempted to lay siege to the surrounding valley. A very large ground force

was sent into this unprepared site. The site was approximately two hundred miles away from its logistics support area in Hanoi. Nevertheless, it was a nearly unanimous opinion, in the French military, that the airfield could be held. The Viet Minh skillfully used the concealment of the jungle to dig artillery in on the forward slopes above the fortress without being observed (Armitage and Mason, 1985). Success for the French depended on the air effort. This effort was conducted in three ways. The air force would interdict enemy supply routes from the north, provide direct offensive air support to the garrison, and maintain the base by airdrop, air landing, and by flying out the casualties.

Unfortunately for the French, the Viet Minh were also able to set up a dense network of anti-aircraft weapons to frustrate their efforts. The French suffered heavy losses in both combat and transport aircraft. The air bridge was severed on many occasions before the French were finally defeated.

At Khe Sanh Viet Cong forces besieged and attempted to capture a U.S. combat base. Though Khe Sanh was of little military significance, the Americans determined to hold it and increased the garrison to four brigades of Marines and one battalion of ARVN (Vietnamese) Rangers (Armitage and Mason, 1985: 97). The scenario was similar to that of Dien Bien Phu. Air congestion quickly became a problem, and regulation of all fixed-wing aircraft in the theater was placed under single control (Armitage and Mason, 1985: 97). The garrison was supported by C-130s, C-123Ks, and helicopters at various times during the siege. C-123s and helicopters together did not have the capacity to sustain Khe Sanh, and bad weather and the lack of accurate parachute drops did not help. Finally, the Air Force reverted to C-130s and cargo extraction. Meanwhile, B-52s were laying carpets of bombs within 3000 feet of Khe Sanh's defense positions. The siege

lasted just over a month, and Khe Sanh was held. Of the three cases to be analyzed, Khe Sanh is the only example of airlift successfully sustaining an isolated base under actual combat conditions.

In each of these three cases, Stalingrad, Dienbienphu, and Khe Sanh, the units under siege were far away from their supply bases. Attempts were made in each situation to supply the besieged units through the use of airlift. One case resulted in success, while two cases resulted in failure. In-depth analysis of these cases will allow us to draw some important conclusions concerning the use of airlift to support isolated units.

Problem Statement

Airlift doctrine will continue to progress as the Air Force pursues greater responsiveness, flexibility, and combat effectiveness. American interests may be challenged in less developed nations where airlift will be the most decisive force projection capability available (Miller, 1988). Tactical airlift operations in this new environment will require pinpoint delivery under hostile conditions. Such capabilities are not easily or automatically achieved, and thorough analysis must be conducted before the doctrine can be developed. Stalingrad, Dienbienphu, and Khe Sanh provide excellent opportunities to study tactical military airlift operations in austere environments. Analysis of these airlift efforts, and their resulting impact on the political situations at the time, may validate efforts to improve formal tactical military airlift doctrine.

Investigative Questions

To evaluate tactical military airlift lessons drawn from the Stalingrad, Dienbienphu, and Khe Sanh experiences, four investigative categories are established. These categories are the definition of the elements of successful tactical military airlift operations, the definition of the scenarios, identification of common aspects between scenarios, and identification of common aspects leading to success or failure.

Elements of Successful Tactical Military Airlift Operations. What are the elements involved in successful tactical military airlift? How are these elements defined?

The Scenario. What were the military situations at Stalingrad, Dienbienphu, and Khe Sanh?

Common Aspects Between Scenarios. Did the defenders at Stalingrad, Dienbienphu, and Khe Sanh experience similar situations during their airlift efforts?

Common Aspects Leading to Success or Failure. Are there common aspects of tactical military airlift operations that can be linked to success or failure?

Importance of Research

Tactical military airlift does not occur in a vacuum. It is a significant part of modern warfare. Troops, equipment, and logistic support can all be moved rapidly to

respond to changing ground situations, to correct initial maldeployments, or to bring additional forces to support a critical area (Mason, 1973: 162). The ability to deploy reserve forces on short notice and then support them is likely to be a significant factor in determining the outcome of future battles (Mason, 1973:164). Planners and leaders must have the confidence to call on tactical military airlift and be assured of success (Miller, 1988: 424).

Current airlift arrangements have worked well in peacetime, when airlift assets are generally adequate to satisfy requirements, but wartime conditions will subject these assets to increased demand. Competition for tactical military airlift resources is likely to develop between theaters as well as within theaters (Miller, 1988: 424). A shift to CONUS-based airpower, budgetary considerations, and airlift problems discovered during Desert Shield/Storm may further complicate matters.

The disintegration of the Soviet Union has caused revolutionary changes in the American military. For the past fifty years the U.S. has concentrated on reinforcing units engaged in the European or Pacific theaters. These units were known as "fight in place" forces, and they were located in established operational bases. The recent closure of a number of overseas bases and possible U.S. involvement in regions with little if any American military infrastructure highlights the importance of tactical military airlift. Military aircraft, Air Expeditionary Forces (AEF), will be expected to launch from the CONUS, fly nonstop to the destination if possible, and then generate combat sorties upon arrival (Looney, 1997: 1). There is a good possibility that the destinations of these aircraft will be austere locations that require tactical military airlift.

Although the ability to provide tactical military airlift could become a crucial factor on future battlefields, tactical military airlift resources may not fare as well in budget allocations as more fire power centered systems (Mason, 1973: 164). The C-130 is currently the only fixed-wing aircraft in the Air Force inventory capable of tactical military airlift other than the C-23s, which are dedicated to the European Distribution System. The other airlift aircraft require too much runway space to be able to conduct tactical airlift operations (Skorupa, 1989: 16).

There are no new aircraft being developed for this mission. Although tactical military airlift is part of the C-17's basic mission, its primary role is strategic airlift (Skorupa, 1989: 18). The development of Vertical Takeoff and Landing (VTOL) aircraft could increase lift capacity and reduce dependence on prepared airstrips, but budgetary constraints have slowed efforts in this direction (Mason, 1973: 163). Helicopters could be used for this mission. They have the advantage of providing rapid reaction to changing circumstances with little regard to terrain. The disadvantage is that their ranges and payloads are more limited than fixed wing aircraft. Successful support of large units would be difficult if helicopters were the only available aircraft. Developing helicopters capable of greater ranges and payloads is possible, but these efforts would face the same budgetary problems as VTOL aircraft (Mason, 1973: 162).

Although operational support airlift successfully performed its wartime mission during both Desert Shield and Desert Storm, shortcomings hindered efficient operations. The failure to consolidate operational support airlift under a single unified airlift control system resulted in inefficient command and control. Airlift capability was often wasted

because different units failed to coordinate their efforts. The result was the unnecessary duplication of missions (Dyche, 1995: 183).

Other problems encountered involved civilian maintenance contracts and wartime air space management procedures. Some civilian companies failed to honor their maintenance contracts by refusing to send their personnel into a hostile area. This casts doubt on the logic of contract logistics support (Dyche, 1995: 185). It was also discovered that operational support airlift crews received no training in wartime air space management procedures, corridor procedures, or silent running operations (Dyche, 1995: 216).

Under more threatening conditions operational support airlift forces could have met with disaster (Dyche, 1995: 182). Dyche used the term “operational support airlift” in his discussion of Desert Shield/Storm. This term does not equate to tactical military airlift. Tactical military airlift would be considered a subset of operational support airlift by Dyche’s definition. However, it is logical to believe that the general operational support airlift problems he described would also have an effect on tactical military airlift. These problems would degrade tactical military airlift capabilities.

Airlift resources are major assets for the furtherance of U.S. security policy. They are an important factor in planning for combat operations (Miller, 1988: 351). Recent political changes suggest that a high proportion of tactical military airlift operations may occur in the future. History also indicates the likelihood of tactical military airlift operations in the future. Problems affecting tactical military airlift have already been identified. This thesis attempts to identify key elements necessary for successful tactical military airlift operations. It is hoped that these observations will generate discussion on

the topic. Further discussion may illuminate the problems of tactical military airlift faced by the military today. The concepts appear to be simple, but history has shown that execution is not always so easy, and failure can have decisive political impacts.

Summary

Chapter II defines elements of successful tactical military airlift and incorporates them in a matrix used to analyze the three scenarios. It also includes the methodology used to develop the matrix and the research method used determine the sources. Chapter III is an historical analysis of the Stalingrad case. It includes a description of the events leading up to the decision to attempt airlift, key facts regarding the airlift, and the results of the airlift. The effects of command and control structures, aircraft availability, operational distances, weather, intelligence reporting, and political considerations are identified. Chapter IV is an historical analysis of the Dienbienphu case. It includes a description of the events leading up to the decision to attempt airlift, key facts regarding the airlift, and the results of the airlift. The effects of command and control structures, aircraft availability, operational distances, weather, intelligence reporting, and political considerations are identified. Chapter V is an historical analysis of the Khe Sanh case. It includes a description of the events leading up to the decision to attempt airlift, key facts regarding the airlift, and the results of the airlift. The effects of command and control structures, aircraft availability, operational distances, weather, intelligence reporting, and political considerations are identified. Chapter VI identifies common aspects between the scenarios and common aspects linked with success or failure. It compares the lessons

learned from all of the cases and draws conclusions regarding the use of tactical military
airlift in the future.

II. Methodology

The method of this thesis is inductive. General observations drawn from the battles of Stalingrad, Dienbienphu, and Khe Sanh are used to develop a general list of important issues to be considered when employing tactical military airlift. For the purpose of this thesis, the use of tactical airlift applies to extreme situations where friendly forces are surrounded or threatened with encirclement and outnumbered by the enemy. Success or failure of airlift to support these forces and ensure their survival is also considered to have a major effect on the outcome of the overall political situation.

Stalingrad, Dienbienphu, and Khe Sanh meet all of these requirements. They are each turning points to which strategic results can be traced. The fact that they occurred in three different wars may also indicate a strong possibility that similar situations will arise in the future. The fact that there are three similar situations of this magnitude in less than fifty years of powered flight is particularly interesting. The possibility of future operations under similar circumstances makes this scenario an important topic for military thought and discussion. Generalized observations can be drawn from the tactical military airlift procedures employed in each of these situations, as well as observations about the military situations themselves. These observations can then be used to understand and evaluate options that may be available when considering tactical military airlift in the future. Decisions concerning the proper application of leadership and technology to tactical military airlift can be made more efficiently when combined with the awareness of the context of similar operations in the past.

These observations may seem simple, but, as Clausewitz said, even the simplest things are difficult in war (Clausewitz, 1976: 119). However, they may allow military thinkers to postulate proper procedures which, when applied evenly and constantly, will acquire some of the nature of a mechanical skill which will eventually do the right thing almost automatically. These procedures serve as indispensable concepts which lead to the development of positive doctrines. Commanders must not fall victim to the temptation to apply these procedures dogmatically in every situation, but rather, bear them in mind to benefit from their truths where they do apply (Clausewitz, 1976: 152).

This thesis is not intended to develop tactical military airlift doctrine. It attempts to use historical narratives of the battles of Stalingrad, Dienbienphu, and Khe Sanh to build a pattern for recognizing and describing similar situations in the future. Although the technology will evolve, these examples indicate that the same issues can be expected.

Research was conducted to determine if there were any common issues between the scenarios. This research indicates that there were nine issues that impacted each scenario. The crucial issues identified in each of the three scenarios are command and control, aircraft availability and capabilities, technology, location and weather, logistical requirements, support and defense, intelligence reporting, training, and political considerations.

Command and control can be divided into two areas. The first area is command and control of the entire operation from the departure bases to the base under siege. The second area is command and control at the besieged site. Each scenario is analyzed to determine how effectively command and control of the entire operation was conducted. Criteria used to determine the effectiveness of command and control include the presence

or absence of centralized command and decentralized control and the establishment or failure to establish a definite chain of command.

Aircraft availability and capabilities refer to the number of usable aircraft that can be dedicated to the mission, and the mission capabilities of those aircraft. The number of aircraft available does not necessarily indicate the number of operational aircraft in each scenario. Mission capabilities include range and payload. Different types of aircraft perform different missions. Examples of different missions are interdiction, ground attack, and transport. The effectiveness of aircraft availability and capabilities is determined by the success of each aircraft type to perform its mission in coordination with the whole airlift operation.

Application of available technologies is another important consideration. Examples of technological innovations might be alternative methods for paradrops, ground sensors to detect enemy movement, or navigational devices which allow all-weather flight. They may be totally new technologies or old technology adapted to fit the situation.

Location and local weather refers to the actual geographical location of the besieged base. Location is divided into two areas. The first area is the distance from supporting bases to the besieged site. The second area is the topographical features at the besieged site. Weather refers to the meteorological conditions at the besieged site. Weather can have a significant effect on airlift operations. Should flying operations be halted due to bad weather, the defenders will be forced to continue without adequate supplies. Successful defense cannot be sustained for long under these conditions. Actions taken by the defenders to minimize these problems and the success of these

actions are the criteria for determining the effectiveness of reactions to location and weather.

The logistical requirements of the garrison are important. Food, water, ammunition, and medical supplies are the key requirements in this type of situation. Proper clothing for seasonal weather changes may also be a consideration. If supply requests are not sufficient to cover the needs, or if the wrong supplies are requested, the garrison will experience difficulty and possibly defeat. Delivery of adequate supplies to sustain the garrison is the criteria for determining the ability to meet logistical requirements.

Support and defense involves ensuring that the necessary weaponry is positioned at the besieged site to keep the base from being overrun by the enemy. It also includes the use of interdiction aircraft and ground attack aircraft working in coordination with the garrison to maintain the position. The ability of the defenders to maintain the size of their perimeter and avoid the loss of their airfield is the criteria used to determine the effectiveness of support and defense activities.

Accurate intelligence gathering should be emphasized. It is important to know the relative strength of the enemy besieging the base. Good intelligence can identify the weapons available to the enemy, numerical strength and experience levels, expected points of attack, and enemy lines of logistics. This information can help prepare the garrison for eminent attacks, and it can target areas for the interdiction and ground attack aircraft to focus on. Disrupting the enemy's line of logistics will ease the pressure on the besieged garrison. The defender's knowledge of the strength and weaponry of the

attacking enemy is the criteria used to determine the effectiveness of intelligence gathering.

Training, for the purpose of this thesis, refers to aircrew training. This may take the form of special training in landing/takeoff procedures or special training in cargo delivery methods. The requirement for special training and the implementation of this training are the criteria used to determine the effectiveness of training.

Finally, no military situation is complete without giving proper consideration to political objectives. Response to political considerations refers to political decisions at the national level that impact the outcome of the airlift effort at the besieged site. The usefulness of political objectives in making meaningful decisions during the airlift is the criteria used to determine the effectiveness of the response to political considerations.

The effects of the issues on each scenario are analyzed using Clausewitz's critical approach. This approach can be divided into three steps. The first step is the discovery and interpretation of equivocal facts. The narratives of each scenario provide these facts. The second step is tracing effects back to their causes. The development of a matrix traces the results of each scenario back to the critical issues. The third step is investigation and evaluation of means employed, which involves praise and censure (Clausewitz, 1976: 156). Chapter VI evaluates the effectiveness of the responses to critical issues in each scenario.

The matrices are used to analyze the issues in the context of each scenario to determine their impacts on the outcome of the situation. The word "Successful" indicates that the issue was handled properly, or in a manner that might lead to success. The word "unsuccessful" indicates that the issue was handled in a manner that might lead to

confusion or even defeat. The words “marginally successful” indicate that the issue did not significantly impact that particular scenario.

The matrices were then used to develop a pattern for recognizing and describing similar situations in the future. Further thought and discussion on these observations could lead to positive airlift doctrine in the future.

Research Method

The process of conducting research for an historical thesis involves reading as much material as possible concerning the topic. This thesis is concerned with the use of tactical military airlift during the battles of Stalingrad, Dienbienphu, and Khe Sanh. Although general descriptions of each of these battles can be found in works encompassing the whole war in which they occurred, there are relatively few sources dedicated to these battles alone. There are even fewer sources dedicated to the topic of tactical military airlift operations during these battles.

Most of the sources available are secondary sources. Because this thesis does not attempt to prove any new theories concerning these battles, secondary sources are sufficient. This thesis uses research conducted by others to define each historical scenario. Information from many sources is collected and compared to ensure that the facts of each scenario are presented accurately. The scenarios are written to reflect only what happened. They are not intended to question the logic behind the decisions. The use of many secondary sources confirms that the facts are accurate.

An accurate representation of the facts gives the reader an understanding of the context in which each of these battles occurred. Comparisons of the material from the

perspective of the research questions are then drawn. Conclusions are then developed in a logical pattern to answer the research questions.

III. Airlift Lessons From the Battle of Stalingrad

Background

Adolf Hitler's Wehrmacht, having survived a terrible Russian winter and an uneasy spring campaign, launched its summer offensive in Russia on 28 June, 1942. Unlike Operation Barbarossa the previous year, the plan did not call for the German Army to attack all along the line. Losses sustained the previous year dictated a much more limited campaign, which Hitler announced on 5 April in Fuehrer Directive No. 41 (Kerr, 1978: 22). This operation became known as Operation Siegfried-Blau-Braunschweig.

Siegfried-Blau-Braunschweig was not designed to bring the war to a quick end. The goal was to capture the Caucasus, which accounted for 70 percent of Russia's oil production, and 65 percent of its natural gas (Kerr, 1978: 24). Other advantages of seizing the Caucasus included electric power, mineral ore (including the world's largest manganese deposits at Chiaturi), cotton, wheat, corn, sugar beets, sunflower seeds, grapes, citrus fruit, cattle, sheep, horses, and pigs (Kerr, 1978: 24). The capture of these resources would benefit the Germans in two ways. It would deprive the Russians of critical resources needed to continue the war, and it would provide more resources for the continuing German war effort.

Hitler realized that a drive toward the Caucasus would leave his left flank exposed to a Russian counterattack. The plan called for the German Army to advance from the area east of Kursk to Voronezh, then southeast along the Don River, and finally, from the

Don to Stalingrad, which was located on the Volga River. Stalingrad itself was of no real value. Beyond the possible disruption of supply and communications between the southern and northern parts of the country, it would serve only as the distant anchor of the defensive line developed to protect the German thrust to the southeast (Kerr, 1978: 22). Lacking troops and equipment, the German Army would be responsible only for the portion of the line up to Voronezh and the portion between the Don and Stalingrad. Poorly equipped Rumanian, Italian, and Hungarian armies were left to hold the line along the Don. Because the Germans believed the Russians had no more reserves, this was not considered a problem.

The German attack commenced on 28 June, 1942. Within nine days the Germans had advanced 100 miles east and reached Voronezh. Turning southeast along the Don, General Friedrich von Paulus, commander of the German Sixth Army, began to move slowly toward Stalingrad. Motorcyclists and light aircraft reported nothing ahead but peasants harvesting grain and Russian troops that were thought to be remnants of escaping front-line armies (Kerr, 1978:72). The Germans reached the Volga on 23 August, having covered over 300 miles. Stalingrad lay to the south, and they began to move in that direction. The Luftwaffe, in coordination with German artillery, proceeded to destroy the city (Whiting, 1978: 113). The all-out assault on Stalingrad began on 13 September, and the Russians were quickly driven back into the heart of the city. The effect of this action was to make the city a fortress for the defenders. The battle rapidly degenerated into house to house fighting. The Germans were not prepared for this. General von Paulus' troops were exhausted from the distance they had traveled, his supply lines were long, and his forces were thin for the job expected of them (Jablonski,

1971: 84). Still, they pressed forward. Meanwhile, the Russians were being reinforced nightly by troops from across the river.

The Russians launched a massive counteroffensive northwest of Stalingrad (code-named Uranus) on 19 November. It was conducted by reserve forces that the Germans apparently had no knowledge of. The Rumanian Army on the Don was shattered and quickly put to full flight (Hayward, 1997: 2). The next day the Russians breached the Axis flank south of Stalingrad, threatening to encircle the Fourth Panzer and the Sixth Armies in two giant pincers (Hayward, 1997: 3). Hitler quickly organized a new army group, Army Group Don, under the command of Field Marshal von Manstein, to launch a relief effort. He also summoned Colonel-General Hans Jeschonnek, chief of the Luftwaffe General Staff, to discuss the air force's role in any attempted breakout or relief operations. Jeschonnek, apparently understanding Sixth Army's encirclement to be temporary, assured Hitler that if both transport planes and bombers were used, and if adequate airfields inside and outside the pocket were maintained, the Luftwaffe could airlift adequate supplies to the army (Hayward, 1997:3). He pointed out that the air force had successfully supplied one hundred thousand men in the Demyansk pocket for several months during the previous winter.

On 22 November, the Russian pincers closed the ring at Kalach, thereby encircling Sixth Army in the land bridge between the Volga and the Don (Jukes, 1985:107). Some 250,000 men were trapped.

Preparations for Airlift

Sixth Army's senior officers believed that if they did not break out immediately, their army would have to be supplied by air for weeks, if not months (Hayward, 1997: 4). Because this would require the air force to deliver 750 tons of supplies per day (this figure was soon reduced to 500 tons per day), they advocated a breakout. Many air force officers also advocated a breakout. Lieutenant-General Martin Fiebig, commander of Fliegerkorps VIII, the Luftwaffe corps responsible for air operations in the Stalingrad sector, discussed the situation over the telephone with Major-General Schmidt, Sixth Army's chief of staff. Fiebig warned Schmidt that supplying an entire army by air was impossible, particularly when transport aircraft were already heavily committed in North Africa. Fiebig's superior, Colonel-General Wolfram Freiherr von Richthofen, proclaimed the plan "stark staring madness," and made every effort to convince the decision makers that the necessary transport resources were not available (Hayward, 1997: 5). Von Richthofen, one of the few men that Hitler might have listened to, was not allowed to speak with him, although he tried.

Jeschonnek was also beginning to have second thoughts as it became more apparent that the airlift would not be as temporary as expected. After talking with von Richthofen and after having his staff check his figures, he soon realized that nothing close to adequate logistical support of Sixth Army by air would be possible, even with consistently favorable weather and disregarding the Russian air force (Hayward, 1997: 8). The standard "250kg" and "1000kg" air-supply containers on which he had based his original calculations actually only carried approximately two-thirds of those loads--the

names derived solely from the size of the bombs they replaced on the racks (Hayward, 1997: 10). When he tried to explain to Hitler that his earlier assessment was made in haste, it was too late. Hitler informed him that Reichsmarschall Goring had given his personal assurance that the air force could meet the army's supply needs.

General Kurt Zeitzler, chief of the Army General Staff, met with Hitler and Goring on 24 November. He strongly opposed the airlift and supported his argument with numbers. The meeting was a stormy one, with Zeitzler and Goring almost coming to blows, but Hitler sided with Goring. The same day, Hitler ordered von Paulus to hold Stalingrad.

A lack of transport aircraft was not the only problem facing the Luftwaffe. Its treatment of airlift was a significant example of the neglect of logistics (Boog, 1978: 142). No mention was made of air transport as a means of supply in the Handbook for the Luftwaffe General Staff Service of 1939, and an air transport command with a competent staff and sufficient authority appeared only after Stalingrad and Tunis, when the Luftwaffe had already lost most of its transport planes (Boog, 1978: 142). As a result, the necessary aircraft and crews for the Stalingrad airlift were formed ad hoc from the advanced flight training schools using mostly Ju-52 aircraft (Boog, 1978: 142).

The Russians also had another surprise for the Germans. The Russian air force (VVS) had achieved superiority in numbers over the Luftwaffe and could now achieve superiority in the air (Whiting, 1978: 113). The Germans were oblivious to Russian reserves of manpower and equipment until Operation Uranus. The Russian Army continued to widen the corridor which the German transports had to overfly, and installed

increasing numbers of anti-aircraft guns in it, while VVS fighters grew increasingly active against the airlift (Jukes, 1985: 146).

The Airlift Begins

Von Richthofen, although he disagreed with the plan, began airlift operations as ordered on 24 November. He had approximately 320 Ju-52 and Ju-86 transports at Tazinskaya (Tazi), and approximately 190 He-111 bombers at Morosovskaya (Moro) with which to conduct the airlift (Whiting, 1978: 114). Neither transport could trade much fuel for freight because it was 140 miles from Tazi to Pitomik, the main airfield at Stalingrad, and the He-111 could only carry two tons of freight (Whiting, 1978: 114).

The resupply operation also fell victim to the fierce Russian winter. The aircraft had to stand down for days on end, with temperatures of 30 below zero, awaiting suitable flying weather. In such appalling weather, the doomed crews could average only ninety-four tons daily (Mason, 1973: 367). Although Goring had promised 500 tons per day, the high-point of the airlift occurred when 700 tons was delivered between 19 and 21 December – that is, 700 tons for all three days combined (Whiting, 1978: 114).

The prospects of the airlift, which had failed to meet its targets so far, were further worsened by the loss of Tazi and Moro airfields on 22 December (Jukes, 1985: 125). This increased the distance the transports had to fly to 200 miles between their new bases and Pitomik. The VVS also made life miserable for the transports, forcing them to fly in formations of forty or fifty with fighter escort, which made loading and unloading on the tiny Pitomik field a serious problem (Whiting, 1978: 114). It also sent attack formations against German airfields to destroy transports on the ground. One of these raids, on 9

January 1943, hit the Sal'sk airfield and destroyed seventy-two aircraft (Whiting, 1978: 115).

Von Manstein gave up hope of relieving Stalingrad on 23 December and ordered Hoth to abandon his attempts to reach the city (Jukes, 1985: 125). Hitler decided that the Sixth Army must hold out until the spring, but everyone knew they could not hold out that long. They were already short of food, fuel, and ammunition, and the airlift had proven incapable of supplying even half of the minimum daily requirements. On a positive note, the airlift did evacuate approximately 29,000 wounded soldiers from Stalingrad.

The Russians offered surrender terms on 8 January, but Hitler ordered the Sixth Army to fight to the last man. The Russian Army mounted another attack on 10 January. Pitomik airfield was overrun on 16 January, and the auxiliary airfield at Gumrak was seized on 21 January (Whiting, 1978: 115). The Sixth Army was split into two pockets by the Russian Army, with no hope of relief or resupply. The Russians offered surrender terms again on 24 January, but Hitler again refused. The northern pocket was destroyed on 30 January. On 31 January, Hitler promoted 118 senior officers in the trapped army. Among these was von Paulus, whom he promoted to Field Marshal, probably as an invitation to commit suicide rather than become the first German Field Marshal to ever be captured (Jukes, 1985: 134). The southern cauldron was wiped out that day. Von Paulus surrendered on 2 February, and all fighting in the city ceased. German radio reported the fall of Stalingrad on 3 February.

Aftermath

When the losses were added up, the German Army had lost enough material to equip a quarter of the German Army. There were approximately 150,000 dead, and another 90,000 taken prisoner, including 24 generals and 2,000 officers. Of these, only about 6,000 returned home. The Luftwaffe lost approximately 488 aircraft and 1,000 air crew (which includes only transport losses) during the Stalingrad airlift (Mason, 1973: 367). The decision to support Stalingrad by airlift was a costly one, and it proved to be a turning point in the war.

Matrix Development

Command and control of the airlift operations at Stalingrad was unsuccessful. The Luftwaffe did not have an air transport command until after the disaster (Jukes, 1985: 205). The lack of command and control resulted in congested air space and the frequent delivery of the wrong supplies. Distribution within the rubble of the city was uncoordinated.

The Luftwaffe suffered from a lack of aircraft at Stalingrad. Due to operations in North Africa, there was a shortage of available transport aircraft (Whiting, 1978: 22). These were limited by payload and range capabilities. There was also a shortage of fighters and ground attack aircraft to protect them.

The technology available during the airlift, though primitive by today's standards, could possibly have been used successfully. The Ju-52 and Ju-86 transports and the He-

111 bombers were capable of performing airlift missions. They had successfully sustained one hundred thousand men in the Demyansk pocket for several months during the previous winter (Hayward, 1997: 3).

The Luftwaffe was unsuccessful at adapting to the weather and the location (Hayward, 1997: 6). The extreme cold reduced already low aircraft availability, and shorter days provided less time for operations. The distance of supporting airfields was increased when the Russians captured the two primary German fields.

Airlift operations failed to provide the proper logistical requirements to the besieged troops. The defenders at Stalingrad never received the level of supplies that would have been necessary to survive against the Russian attacks. What they did receive was sometimes useless in their situation.

The Sixth Army had good weaponry, but it was grossly outnumbered. Unable to obtain adequate supplies, it could not have been expected to survive. The Luftwaffe lost air superiority, and this led to the failure to provide adequate supplies (Whiting, 1978: 115). As the Sixth Army became weaker, the Russian ring tightened. As the ring tightened, airlift operations became more difficult. Finally, the airstrips were captured by the Russians. This ended airlift operations.

German intelligence reporting was completely unsuccessful in recognizing the arrival of strong Russian reinforcements in men and equipment. Von Paulus was attacking an enemy he believed to be retreating in disorder when it really consisted of fresh reserves lying in wait (Kerr: 1978: 210).

German pilots flying the airlift missions seem to have been adequately trained for their duties, although many were young and had little wartime experience. This is

evidenced by the fact that a large number of the crew members were taken from advanced training schools (Boog, 1978: 142). The experience level of the pilots did not seem to have an adverse effect on operations.

Hitler was unsuccessful in making the correct political decision. He failed to realize that this disaster might shift the momentum of the war against him. He risked forfeiting the Sixth Army to prove that the German Army could defend a position that served no purpose. It simply bore Stalin's name. He lost his gamble.

Table 1 shows the degree of success experienced by German forces during airlift operations at Stalingrad. The word "successful" indicates that the issue was handled properly, or in a manner that might lead to success. The word "unsuccessful" indicates that the issue was handled in a manner that might lead to confusion or defeat. The words "marginally successful" indicate that the issue did not significantly impact the scenario.

Table 1. Stalingrad

<u>Issue</u>	<u>Degree of Success</u>
Command and Control	Unsuccessful
Use of Aircraft Availability/Capabilities	Unsuccessful
Use of Technology	Marginally Successful
Ability to React to Location and Weather	Unsuccessful
Ability to Meet Logistical Requirements	Unsuccessful
Support and Defense Activities	Unsuccessful
Intelligence Gathering	Unsuccessful
Training	Marginally Successful
Response to Political Considerations	Unsuccessful

IV. Airlift Lessons From the Battle of Dienbienphu

Background

General Henri Navarre replaced General Raoul Salan as the French commander in chief, Indochina, on 21 May 1953. Because the fortunes of war had shifted in favor of the Vietminh in 1952 and early 1953, he found a grim situation. Senior French commanders expected the Vietminh, led by General Giap, to launch a major offensive in the fall 1953 against either Laos or the Tonkin Delta (Davidson, 1988: 162). Navarre's task was to go to Indochina, assess the military situation, and prepare a plan of operations. He left for Paris in early July 1953 to present his plan and request additional troops (Davidson, 1988: 167). The basis of his strategy was to remain on the defensive to restore the physical and moral health of the Expeditionary Corps, but to adopt an offensive attitude, and harry the enemy to prevent him from bringing his divisions together in a combined action and destroy him wherever he was outnumbered (Roy, 1965: 16). The plan also called for the defense of northern Laos. Navarre was searching for a strategy to defend northern Laos, and Colonel Louis Berteil had one, the hedge hog concept, which envisioned establishing a fortified airhead astride a key Vietminh supply line into Laos (Davidson, 1988: 173). Dienbienphu would first have to be recaptured before this plan could be carried out.

The plan was opposed by many important people. General Corniglion-Molinier, the French Minister of State, expressed reservations concerning first, the possibility of the enemy occupying the hills surrounding Dienbienphu and, second, its distance from Hanoi

and Haiphong, from which airlift support would come (Roy, 1965: 18). Major-General Rene Cogne believed that Dienbienphu would become a drain on manpower with no useful influence but with serious consequences (Roy, 1965: 26). He did not make this opinion known to Navarre. Colonel Jean Louis Noel Nicot, the officer commanding air transport in the Expeditionary Corps, made his opinions perfectly clear to Navarre. He said that his aircraft were not in a position to maintain a permanent flow of supplies to Dienbienphu, and that tampering with loading figures and operational instructions in the face of meteorological or tactical circumstances for very long would risk disaster (Roy, 1965: 28).

Totally disregarding these warnings, Navarre put his plan into action on 20 November 1953. At the very moment that Navarre was launching the assault on Dienbienphu, the Committee of National Defense advised him to adapt his plans to his means and limit his ambitions to containing the enemy because he would not get the reinforcements he had asked for (Roy, 1965: 42). Believing it would take Giap several weeks to concentrate even one division at Dienbienphu and that he could not sustain even a two division force for any extended period, Navarre proceeded with his plan (Davidson, 1988: 189). He based this belief on the problems of distance, bad roads, and truck shortages that Giap would face.

Operation Castor, as it was called, began with an airborne assault on Dienbienphu. The Sixth Parachute Battalion landed 200 meters north of the village, and airborne troops of the Second Battalion, First Regiment dropped 600 meters to the south (Davidson, 1988: 193). These forces were responsible for clearing Dienbienphu of enemy forces and securing the dirt airstrip north of the village. The mission was accomplished with

minimal losses. The following day two more parachute battalions were dropped along with an artillery battalion, command headquarters, and heavy equipment. On 22 November, the sixth and final parachute battalion landed. The paratroopers began by preparing the airstrip to handle small aircraft, digging light field fortifications, clearing fields of fire, and pushing patrols and outposts to the first ridge lines (Davidson, 1988: 196).

Operations around Dienbienphu soon became the center of operations in northwest Vietnam, and the most important front in the theater (Davidson, 1988: 210). Vietminh activity in this area increased rapidly, but Dienbienphu was not bothered. Navarre believed these many-sided attacks were due to a Vietminh hesitancy to directly attack Dienbienphu because of supply difficulties (Giap, 1964: 69). In reality, these attacks served to scatter French forces in many directions while pinning down the forces at Dienbienphu (Giap, 1964: 75).

The French, as well as the Vietminh, regarded Dienbienphu as a strategic position. Whoever held it could control the whole region and part of Southeast Asia provided he held both the basin and the heights surrounding it, and that he built roads and an airfield equipped with all modern technical aids, spread out over a vast area (Roy, 1965: 37). The French forces occupied a fortified entrenched camp having three sub-sectors which supported one another with forty-nine strong-points (Giap, 1964: 78). Navarre believed that the poor roads in this hilly region would deny the Vietminh the ability to bring up artillery. Pursuing this train of thought, he believed that Dienbienphu would finally enable French forces to bring their superior firepower to bear against the Vietminh in a pitched battle that would extinguish their core (Gurtov, 1967: 93).

Giap, although understanding the disadvantages facing the Vietminh due to terrain, realized that these same characteristics, regarded by the French as strengths, might be used to his advantage. Dienbienphu's isolated position in the middle of an immense and hilly region far away from friendly forces made its supply and reinforcement entirely dependent on air transport (Giap, 1964: 87). If supplies were cut off or blocked, this powerful, fortified entrenched camp would be left with its weak points exposed, gradually lose its fighting ability and initiative, land in a defensive position, and face more and more intricate conditions (Giap, 1964: 87). The rough terrain would also make withdrawal difficult.

The French, unwittingly, fell into this trap. Due to the difficulty involved in holding the crests, the French installed themselves in the hollows, where planes and trucks could be driven, and abandoned the heights to the enemy in the conviction that they themselves possessed superior firepower (Roy, 1965: 36). They believed that the vastness of this basin would protect it from surprise attack, and that the enemy would never be able to approach it without breaking himself against it (Roy, 1965: 36). They did not realize that due to the proximity of the surrounding mountains a few well placed Vietminh guns could disrupt airlift operations (Roy, 1965: 37).

This oversight, coupled with the arrival of shipments of heavy artillery from China and directives for their placement, convinced Giap that it was time to meet the French in a set-piece battle (Gurtov, 1967: 93). The Vietminh now possessed numerical superiority, and the tactical advantage of occupying the hillsides ringing the garrison cleared the way for an all out drive (Gurtov, 1967: 93). The first reports of heavy fighting involving aircraft and artillery came on 30 January 1954. Giap began to tighten

his encirclement of the fortress, and by mid-March he was ready to attack (Gurtov, 1967: 69). He did so on 13 March 1954.

The Airlift Begins

Navarre and Giap understood the ensuing logistics battle. Each had to supply his own forces while denying the enemy adequate supplies. The Vietminh logistic system depended on trucks and porters while the French system depended on airlift and interdiction (Davidson, 1988: 214). The French appeared to have logistical superiority, but Navarre wrote to the French Government that the Indochina theater had become “above all an air battle” which, if lost could mean the end of the entire French effort (Gurtov, 1967: 51). Apparently he recognized the possible predicament facing the garrison at Dienbienphu.

The distance of nearly two hundred miles between Hanoi and Dienbienphu complicated and aggravated the Air Force’s operational conditions (Roy, 1965: 32). Nevertheless, the French air arm, both air force and navy, put forth a maximum effort to halt the flow of supplies to the Vietminh at Dienbienphu (Davidson, 1988: 216). They failed miserably. The failure can be traced to the inadequacy of forces deployed and to fierce anti-aircraft protection employed by the Vietminh. The French had approximately 130 aircraft available in northern Vietnam to provide close air support and interdiction (Davidson, 1988: 217). These consisted of fighters, fighter bombers, B-26 medium bombers, and C-119 transports equipped for napalm bombing. Of these aircraft, only 75 percent could be kept operational at one time (Davidson, 1988: 217). The low operational level was due to an undermanned maintenance force.

The primary line of communications (LOC) for the Vietminh became a “flak corridor,” and nearly all of the French aircraft sustained hits when attacking trucks and troops along it, forcing them to higher altitudes and decreasing effectiveness (Davidson, 1988: 217). Another effect of this was to divert aircraft to flak suppression missions, thus further limiting the force available for their interdiction task (Davidson, 1988: 217). As a result, the French failed to keep supplies from reaching the Vietminh at Dienbienphu.

The French air-based supply system was also inadequate for the task it was assigned. One problem was a shortage of airlift aircraft. Different sources cite different figures, but a realistic “in operation” figure would run between sixty to seventy-five aircraft, mostly C-47’s (Davidson, 1988: 218). To maintain combat effectiveness at Dienbienphu, these aircraft would have had to deliver a minimum of 200 tons of supplies per day (Davidson, 1988: 219). The garrison never received more than half of this tonnage for various reasons.

The distance of airfields (almost two hundred miles) from which the transports could operate was one problem. Rugged mountains, soft lowlands, and Vietminh presence between Dienbienphu and the Hanoi area made it nearly impossible to construct new airfields (Davidson, 1988: 218). Poor weather and unreliable French maps increased operational safety hazards (Davidson, 1988: 218).

Vietminh actions disrupted the French airlift efforts. The destruction or damage of seventy-eight aircraft (mostly transport) by saboteurs at Gia Lam and Cat Bi airfields on 6-7 March 1954, demonstrates Giap’s understanding of the importance of airlift capability in this situation (Davidson, 1988: 219). On 14 March, the second day of the battle, the French lost the use of their airstrip at Dienbienphu after devastating Vietminh

artillery fire destroyed the runway, the control tower, the radio beacon, and the aircraft that remained (Davidson, 1988: 237). Supplies and reinforcements had to be delivered by parachute for the remainder of the siege. The loss of the airstrip denied airlift for the removal of wounded soldiers and made a French withdrawal by air impossible.

Airdrops were first conducted from 2,500 feet, but the concentration of Vietminh anti-aircraft artillery and the subsequent mounting number of aircraft losses caused the drop altitude to be moved up to 6,000 feet, and finally up to 8,500 feet (Davidson, 1988: 219). As the drop altitude increased, so did the dispersion of supplies. This dispersion worsened as the defenders were gradually overrun and the drop zone was reduced. The French defenders never recovered over 100 tons a day, and the Vietminh intercepted the rest – including ammunition that they could use in their howitzers against the defenders (Davidson, 1988: 219).

Finally, the French defenders had a difficult time collecting the supplies even when they did land within the perimeter. Vietminh artillery fire progressively destroyed the few trucks and jeeps available, so collection had to be done largely by hand (Davidson, 1988: 219). All semblance of a centralized logistics system disappeared, and all supplies were generally used at the strongpoints on which they fell (Davidson, 1988: 219).

The Vietminh overran Dienbienphu's main position on 7 May 1954 after a siege of fifty-five days (Gurtov, 1967: 115). Colonel Lalande ordered the last group of French defenders to cease fire on 8 May 1954.

Aftermath

When the losses were added up, the French had lost more than 16,000 men, dead or wounded, and their equipment (Giap, 1964: 140). This figure includes the entire command staff which consisted of 1 general, 16 colonels, and 1,749 officers and non-commissioned officers (Giap, 1964: 140). They had lost 62 aircraft shot down or destroyed at Dienbienphu (Giap, 1964: 140). The decision to fight a set-piece battle at Dienbienphu, an area that would have to be supported by airlift, particularly when the French Air Force was too weak to be effective, was a costly one (Milton, 1978: 306). The disaster at Dienbienphu ensured the loss of France's empire in Indochina.

Matrix Development

Command and control of airlift operations at Dienbienphu was unsuccessful. Lack of coordination resulted in congested air space and the frequent delivery of the wrong supplies. An inadequate command and control structure at the garrison resulted in many units failing to receive necessary supplies while others received too much (Davidson, 1988: 219).

The French were unsuccessful at providing the number of aircraft necessary for success in supporting such a large force by airlift. A lack of aircraft maintenance personnel resulted in reduced capabilities (Davidson, 1988: 217).

The French were marginally successful in their use of technology. They used the only two methods available at the time which were to land and unload or to paratroop.

The French were unsuccessful at overcoming the challenges of location and weather. Monsoon weather limited the time available for airlift operations (Davidson,

1988: 218). The distance to Dienbienphu was barely within range of the aircraft used to resupply it. Enemy gun emplacements on the surrounding hills further complicated the situation.

The French were unsuccessful at providing the logistical requirements necessary for the survival of the garrison. The garrison never received more than half of the tonnage required to sustain it (Davidson, 1988: 219).

The French were armed with adequate weapons, but they were unsuccessful in their use of these against the enemy (Gurtov, 1967: 93). They allowed the Vietminh to occupy the surrounding hills and set up artillery. These enemy positions were devastating to the French Garrison. The scarcity of ground attack aircraft left the French airlift effort vulnerable to enemy gunfire (Davidson, 1988: 217).

French intelligence reporting was unsuccessful at identifying the large enemy troop movements around Dienbienphu. The garrison had no idea what it was up against until it was too late (Davidson, 1988: 189).

The French were marginally successful with training – maintenance crews aside. The pilots seem to have had the necessary skills for such an operation.

The French were unsuccessful in regard to political considerations. They allowed the decisive battle to be fought in an area that negated their technological superiority, and they expected to win because they were French. Once committed to the battle, they refused to withdraw. They would not accept the possibility that a world power such as France could be defeated by the technologically limited Vietminh. They were wrong.

Table 2 shows the degree of success experienced by French forces during airlift operations at Dienbienphu. The word “successful” indicates that the issue was handled

properly, or in a manner that might lead to success. The word “unsuccessful” indicates that the issue was handled in a manner that might lead to confusion or defeat. The words “marginally successful” indicate that the issue did not significantly impact the scenario.

Table 2. Dienbienphu

<u>Issue</u>	<u>Degree of Success</u>
Command and Control	Unsuccessful
Use of Aircraft Availability/Capabilities	Unsuccessful
Use of Technology	Marginally Successful
Ability to React to Location and Weather	Unsuccessful
Ability to Meet Logistical Requirements	Unsuccessful
Support and Defense Activities	Unsuccessful
Intelligence Gathering	Unsuccessful
Training	Marginally Successful
Response to Political Considerations	Unsuccessful

V. Airlift Lessons From the Battle of Khe Sanh

Background

Khe Sanh Combat Base, established by the Green Berets in August 1962, was located in the Quang Tri province and was responsible for surveillance and counter-infiltration operations (Shore, 1969: 8). The base sat atop a plateau in the shadow of Dong Tri Mountain and overlooked a tributary of the Quang Tri River (Shore, 1969: 8). It was useful as an observation post, and it was a platform for launching special operations forays and the road watch teams the United States used to monitor NVA activities in Laos (Prados, 1991: 9). It could also be used as a starting point for the invasion of Laos if the opportunity ever arose (Prados, 1991: 9).

Khe Sanh airstrip, initially too small for C-130 operations, had been improved in 1967 making it capable of accommodating helicopters and fixed-wing transport aircraft. It had organic artillery support, and its area of operations was within the range of the 175mm guns of Camp Carroll (Shore, 1969: 8). General William C. Westmoreland, Commander, United States Military Assistance Command Vietnam (MACV), believed that Khe Sanh's geographical location would bar the enemy access to the coastal plains (Prados, 1991: 7).

United States intelligence began to receive reports of several North Vietnamese Army (NVA) units beginning to move south in late November 1967 (Davidson, 1988: 554). By late December, it became clear that two of these divisions were moving to the Khe Sanh area, and another was moving to within easy supporting distance (Davidson,

1988: 554). One of these divisions, the 304th, was an elite home guard division from Hanoi which had been a participant at Dienbienphu (Shore, 1969: 29). The entire force consisted of six infantry regiments, two artillery regiments, an unknown number of tanks, and miscellaneous support and service units (Shore, 1969: 29). As NVA emphasis shifted from reconnaissance and harassment to actual probes and exertion of force on Allied outposts and patrols, American intelligence began to believe that something big was about to happen (Shore, 1969: 29).

The book *Hell in a Very Small Place*, a classic history of Dienbienphu by Bernard B. Fall, made many people in the United States skeptical about the capability of US firepower and air power to outmatch the NVA in disadvantageous territory (Prados, 1991: 110). The similarities between Dienbienphu and Khe Sanh were unsettling. General Westmoreland, realizing that General Giap would have to mass his troops to overrun Khe Sanh, saw it as an opportunity to bring optimum firepower to bear against the NVA in an isolated area (Davidson, 1988: 553). Khe Sanh's remote location would free him from the constraints associated with combat operations near highly populated areas. Westmoreland also noted many advantages the marines had at Khe Sanh that were not available at Dienbienphu. Key points in his argument were that the United States had additional artillery outside the immediate battle zone that could reinforce Khe Sanh by fire, much greater capacity for aerial resupply than the French had had at Dienbienphu, and air support assets greater by "orders of magnitude" (Prados, 1991: 290).

A marine patrol made the first contact with an NVA patrol in the Khe Sanh area on January 2, 1968. Later, on 20 January, a deserting NVA officer surrendered to an outpost of marines and told his interrogators that the NVA would attack the marine

outposts on Hills 881N and 861, and the combat base at Khe Sanh, that night (Davidson, 1988: 554).

The NVA struck Khe Sanh and its outposts with rocket, artillery, mortar, and small arms fire at 0530 on January 21st (Davidson, 1988: 558). The ammunition depot and the fuel supplies were blown up, and heavy fighting occurred on Hill 861, but the marines held their posts (Davidson, 1988: 558). General Westmoreland ordered Operation NIAGARA to be executed. This operation, in the planning stage since early January, called for Khe Sanh to be defended not only by the Marine garrison, but by awesome firepower supplied by B-52s, tactical air, artillery, and mortars (Davidson, 1988: 558). An expanded intelligence effort utilizing all intelligence devices, including the new acoustic and seismic sensors, would be used to target this firepower (Davidson, 1988: 558).

The importance of the hill outposts was immediately recognized, and the marines held on to them doggedly. Had the NVA been able to knock the marines off those summits, they would have been able to fire down the throats of the base defenders and make their position untenable (Shore, 1969: 57). It would also have made resupply by air virtually impossible.

Preparations for Airlift

Khe Sanh was defended by 6,680 marines, and it was estimated that the supply requirement necessary to sustain this force would be 235 tons per day (Prados, 1991: 373). The task of delivering these supplies fell to the C-130s of Marine Aerial Refueler Transport Squadron 152 and the U.S. Air Force 834th Air Division; the C-123s of the

315th Air Commando Wing; the UH-34, CH-46, and UH-1E helicopters of Marine Aircraft Group 36 (MAG 36); and the CH-53 choppers of MAG 16 (Shore, 1969: 72). General Westmoreland designated General William W. Momyer, USAF, as his single manager to control all tactical aircraft operating in the Khe Sanh area, including those of the Air Force, the Marines, and the Navy (Davidson, 1988: 558). The Army, Navy, and the Marines protested this decision, fearing the loss of their aviation branches, but Westmoreland successfully defended his decision.

Command and control of airlift operations at Khe Sanh did not start out smoothly. Major John Havlik, a management specialist for the 1st Marine Air Wing, noted that the ground element consisted of a haphazard collection of forward detachments of units located elsewhere (Prados, 1991: 371). These units reported to their remote parent outfits, and this resulted in a lack of overall task organization. Although he had no real authority, Major Havlik informed these units that he was the officer in charge of the airfield and that there was a definite chain of command (Prados, 1991: 371). The establishment of this level of organization enabled him to mobilize effective crews for the conduct of operations necessary for successful airlift support.

Weather was another factor that had to be considered in airlift operations in support of the Khe Sanh Combat Base. Even under good weather conditions the airlift would have been difficult. The weather at this time of the year was miserable at Khe Sanh. Difficult operations were compounded by the poor visibility which was below minimum for airfield operations 40 percent of the time (Shore, 1969: 74). The NVA often used this heavy fog cover to set up anti-aircraft weapons in advantageous positions. These difficulties were compensated for by orders from the White House specifying that

flights earmarked for Khe Sanh should be programmed at 120 percent of requirements, and that no such requirements could be diverted without special authority (Prados, 1991: 373).

Plans also had to be made for transporting supplies to the hill posts. This mission had to be carried out by helicopter. Before the supplies could be sent to the hill posts they had to be landed at the main base, unloaded, and repacked into smaller loads by the logistics support unit (Prados, 1991: 380). The Marine command typically assigned a direct support package of two UH-1Es, two to four CH-46 cargo carriers, and a couple of UH-34 utility ships to resupply the hilltops and provide medical evacuation (Prados, 1991: 380).

The tactical use of other strategic aircraft would also be tested. Close-in ARC LIGHT strikes by B-52s were planned to break up suspected NVA assaults (Prados, 1991: 380). Finally, A-4 Skyhawks would provide suppressive fire against NVA positions during resupply missions.

The Airlift Begins

Pilots of fixed wing aircraft attempting to land at Khe Sanh faced a difficult and dangerous task. The key for survival was a steep approach through the eastern corridor, a short roll-out, and a speedy turnaround after landing (Shore, 1969: 74). The C-123s, with a shorter landing roll and auxiliary jets to assist in takeoff, had it easier than the C-130s which often had to roll out the full length of the runway and then taxi back to the loading ramp (Prado, 1991: 375).

On February 10th, a Marine C-130 carrying fuel bladders was hit by NVA fire and destroyed (Shore, 1969: 76). The result of this accident and damage sustained by other transports was the suspension of C-130 landings at Khe Sanh (Shore, 1969: 76). The situation called for innovation, and the Air Force provided it in the form of the Low Altitude Parachute Extraction System (LAPES) and the Ground Proximity Extraction System (GPES). LAPES was a self contained system that used a reefed cargo parachute to extract roller mounted cargo pallets from the aircraft from approximately five feet off the ground (Shore, 1969: 76). GPES extracted cargo by means of snagging an arresting cable, similar to those used on aircraft carriers, with a hook extended from the boom at the rear of the aircraft (Shore, 1969: 76). Low overcast weather precluded the use of either system most of the time, and by the time the siege was over, there had been only 15 GPES deliveries and 52 LAPES deliveries (Prados, 1991: 379).

The preponderance of supplies were delivered by paratroops which required close air/ground coordination between the C-130 pilots and the Marine Air Traffic Control Unit (MATCU). The average distance that bundles landed from the impact zone was 133 meters, which was well within the dropzone (Shore, 1969: 79). These paratroops were sufficient for commodities like rations and ammunition, but there were certain items like medical supplies, special ammunition, and other delicate cargo along with replacements and casualties that would not permit parachute landing (Shore, 1969: 79). These jobs were left to the C-123s.

The resupply of hill outposts was particularly dangerous. The perimeters atop the hills were too small for parachute drops, so they had to be supplied by helicopters. Concentrated NVA fire caused a rapid rise in the attrition of helicopters, and this resulted

in the search for a new technique (Shore, 1969: 84). The solution was for all of the helicopters to fly close together in a “supergaggle” to their destination while A-4s softened up enemy positions with napalm, and tear gas, and laid a smoke screen for the helicopters (Shore, 1969: 86). These tactics were so successful that during the period of the “supergaggle” only two CH-46s were downed enroute to the hill positions (Shore, 1969: 86). The introduction of the “supergaggle” was a turning point in the resupply effort (Shore, 1969: 89). Throughout the siege, helicopters continued their flights to and from Khe Sanh.

The airlift also had two very positive effects on morale. These were the arrival of mail and the swift departure of casualties. During the worst month of the siege, over 43 tons of mail was received at Khe Sanh (Shore, 1969: 90). It is also estimated that the defenders’ efficiencies were improved by the knowledge that if they were hit they could expect immediate medical attention and when necessary, a speedy evacuation (Shore, 1969: 92).

The last sizable NVA attack on Khe Sanh occurred on the night of February 29th-March 1st (Davidson, 1988: 561). Although they continued to harass the Marines with artillery and mortar fire until March 30th, the NVA began to withdraw from Khe Sanh on March 6th, in effect ending the siege. Operation PEGASUS, a combined relief force of marines and troopers of the 1st U.S. Air Cavalry Division reached Khe Sanh on April 8th (Davidson, 1988: 561). The defenders survived the siege.

Aftermath

Although they were subjected to concentrated NVA fire, the marines at Khe Sanh were seldom in real danger of being overrun during the entire siege. Marine and U.S. Air Force transport pilots, helicopter crews, loadmasters, and ground personnel kept open the supply line that meant life for Khe Sanh (Shore, 1969: 92). MAG-36 and MAG-16 flew 9,109 sorties, transported 14,562 passengers, and delivered 4,661 tons of cargo in support of Khe Sanh combat base (Shore, 1969: 89). Air Force planes were responsible for approximately 12,430 tons delivered during the siege, and the high delivery of the campaign was 310 tons, delivered on January 27th (Prados, 1991: 373).

Khe Sanh, which was held by one marine regiment, tied down two or three NVA divisions, keeping them from taking part in the Tet Offensive (Davidson, 1988: 570). In the siege of Khe Sanh, air power, in conjunction with air-supplied troops on the tactical defensive, was successfully applied (Bowers, 1978: 314).

Matrix Development

Command and control of airlift operations during the battle of Khe Sanh was successful. General Westmoreland appointed General Momyer to oversee the airlift operations (Davidson, 1988: 558). Flights into Khe Sanh were coordinated. A chain of command was developed within the garrison to ensure efficient downloading of aircraft and proper distribution of supplies.

The United States was successful in providing an adequate number of aircraft for airlift and support. These consisted of helicopters and fixed wing (Shore, 1969: 72). The

aircraft were capable of operating within the required range, and they were capable of adequate payloads.

The United States successfully used technology. LAPES, GPES, and ground sensors are examples of some of the ways technology was successfully used (Shore, 1969: 76).

The United States was marginally successful at overcoming the problems caused by weather and location. Monsoon weather interfered with airlift operations 40 percent of the time, but this was taken into account during planning (Prados, 1991: 373). Extra cargo was carried on each mission to compensate for this. Khe Sanh was also well within range of the supporting aircraft.

The United States was marginally successful at providing adequate logistical requirements to support the garrison. Weather and enemy ground fire sometimes reduced the level of resupply below the requirements, and sometimes the wrong supplies were sent (Shore, 1969: 84). Overall, the airlift provided adequate supplies for the garrison's survival.

The United States was successful at support and defense of Khe Sanh. The Marines maintained a strong defense of the perimeter and set up artillery in the surrounding hills (Shore, 1969: 57). This denied the enemy positions that would have been advantageous to his offense. Ground attack aircraft did an excellent job of destroying enemy positions and suppressing anti-aircraft fire during airlift operations (Davidson, 1988: 558).

The United States benefited from successful intelligence reporting. Enemy troop movements and strengths were known with accuracy (Davidson, 1988: 554). This allowed successful air strikes against enemy positions and logistics lines.

The United States successfully utilized training. Aircrews flying into Khe Sanh were required to have certain levels of training. These pertained to special takeoff and landing requirements, and the use of GPES and LAPES.

The United States was marginally successful to unsuccessful in its handling of political considerations. It was marginally successful with respect to the fact that the garrison at Khe Sanh survived the siege. It was unsuccessful with respect to the fact that it achieved nothing. It only proved that the United States could hold the position. Khe Sanh was abandoned soon after. The cost of supporting Khe Sanh was very expensive in manpower and material, and no real political achievement was gained.

Table 3 shows the degree of success experienced by American forces during airlift operations at Khe Sanh. The word "successful" indicates that the issue was handled properly, or in a manner that might lead to success. The word "unsuccessful" indicates that the issue was handled in a manner that might lead to confusion or defeat. The words "marginally successful" indicate that the issue did not significantly impact the scenario.

Table 3. Khe Sanh

<u>Issue</u>	<u>Degree of Success</u>
Command and Control	Successful
Use of Aircraft Availability/Capabilities	Successful
Use of Technology	Successful
Ability to React to Location and Weather	Marginally Successful
Ability to Meet Logistical Requirements	Marginally Successful
Support and Defense Activities	Successful
Intelligence Gathering	Successful
Training	Successful
Response to Political Considerations	Marginally Successful to Unsuccessful

VI. Conclusions

Overview

Stalingrad, Dienbienphu, and Khe Sanh can be seen as laboratories for observing the various approaches to the conduct of tactical military airlift and their consequences. From these examples, a broader understanding of the tradeoffs and consequences inherent in these operations can be drawn. Tactical military airlift failed at Stalingrad and Dienbienphu, but it was successful at Khe Sanh. Analysis of these scenarios indicates that each involved nine common factors. These factors were command and control, aircraft availability/capabilities, technology, location/weather, logistical requirements, support/defense, intelligence reporting, training, and political considerations.

Common Elements

The nine elements common in each scenario appear to cover simple military principles that any military thinker would consider. However, each scenario shows that under actual combat conditions these simple considerations become difficult. Leaders often approach them unrealistically, and sometimes they totally overlook them. This is due to the lack of perfect information, or "fog and friction," in war.

Command and Control. Command and control was totally overlooked at Stalingrad and Dienbienphu. The Germans and the French had to know the importance of centralized command and decentralized control. The Germans successfully demonstrated it in their blitzkrieg tactics, and the French demonstrated it in actions

preceding Dienbienphu. Nevertheless, they failed to recognize a need for command and control of airlift operations. This failure resulted in uncoordinated efforts. The wrong supplies were frequently delivered, and air space was congested. Ground units at the garrisons lacked local command and control. There was no standard procedure for the distribution of supplies. These problems with command and control had negative effects on aircraft availability/capabilities, logistical requirements, and support/defense of the combat bases.

In congested airspace caused transports to be subjected to enemy anti-aircraft fire for longer periods of time. At Stalingrad, the transports were also exposed to enemy fighters. This exposure resulted in heavy losses in transport aircraft, reducing their availability. The reduced availability increased the difficulty of delivering adequate logistical requirements. Without adequate supplies, defensive operations cannot be sustained.

The importance of command and control in airlift operations was recognized at Khe Sanh. General Westmoreland designated General Momyer as the single manager in control of air operations supporting Khe Sanh. Centralized command resulted in excellent coordination of ground attacks, anti-aircraft suppression, and airlift efforts. Command and control at the garrison resulted in adequate supplies reaching all units. There were problems, but command and control was generally successful. It helped keep aircraft losses low and adequate supplies flowing, which sustained the garrisons ability to continue defensive operations.

Use of Aircraft Availability/Capabilities. Aircraft availability was scarce at Stalingrad and Dienbienphu. Limited numbers of transport aircraft made it impossible to supply the minimum requirements, and the lack of fighter escorts and ground attack aircraft increased the risk of the transports that were available. Certain capabilities like LAPES, GPES, and rotary aircraft had not been developed yet.

During the Stalingrad airlift, the Luftwaffe was heavily committed in two other regions, North Africa and France. Demands for aircraft availability in these regions reduced the Luftwaffe's ability to effectively concentrate its forces for the Stalingrad airlift. It also lost air superiority to the VVA.

During Dienbienphu, the French did not face an enemy air force, but they did not have enough aircraft to suppress enemy anti-aircraft fire. This resulted in heavy losses of transport aircraft. Navarre understood that he could not expect the delivery of additional aircraft assets, but he continued with his plan. He totally underestimated his enemy. Airlift availability was further hindered by a lack of maintenance personnel.

At Khe Sanh, aircraft availability was good in all categories. Ground attack aircraft were available in sufficient numbers to disrupt enemy buildups and to suppress enemy anti-aircraft fire while the transports landed and took off. Fixed winged aircraft were available in sufficient numbers to deliver the minimum requirements to the garrison. Helicopters were also available to airlift supplies to areas that were geographically isolated from the main base.

In all of these scenarios, the aircraft available were capable of operating over the ranges necessary. However, at Stalingrad and Dienbienphu, the aircraft were near their maximum ranges. At Stalingrad, the Russian capture of two supporting air bases reduced

German airlift capabilities by increasing the distance to the city. The increased distance forced the aircraft to carry less supplies and more fuel. The distance from supporting bases to Khe Sanh were not significant enough to impact airlift operations.

Use of Technology. Airlift technology was available at Stalingrad, Dienbienphu, and Khe Sanh. However, the technology was limited to airdrops and transport landings at Stalingrad and Dienbienphu. Although the technology was not properly coordinated into war plans and it failed to accomplish its objectives, the technology was not to blame. The U.S. experimented with technology to improve the chances of success at Khe Sanh. LAPES and GPES were used to extract supplies from transport aircraft without landing. Ground sensors were also used to locate enemy movements and target areas for ground attack. Each of these things contributed to the success of airlift operations at Khe Sanh.

Ability to React to Location and Weather. Location and weather had negative impacts on each of the scenarios. Although within range of airlift aircraft, Stalingrad and Dienbienphu were far away from their supporting airbases. Stalingrad was in a flat, open area that was advantageous to Russian air superiority. Dienbienphu and Khe Sanh were located in valleys surrounded by mountainous country. This decreased the effectiveness of French and American air superiority. Enemy gun emplacements in these mountains created difficulties for airlift operations.

The weather was poor for flying operations at Stalingrad, Dienbienphu, and Khe Sanh. At Stalingrad, flying operations were hindered by the severe cold of the Russian winter. Shorter days also had a negative impact on Luftwaffe airlift efforts. Monsoon

weather was experienced at Dienbienphu and Khe Sanh. Rain and fog disrupted airlift operations in both of these scenarios. The U.S. was the only nation to recognize the need to compensate for these disruptions. This recognition led to the decision to program higher daily requirements for airlift into Khe Sanh. These extra supplies compensated for supplies not delivered during bad weather.

Ability to Meet Logistical Requirements. The participants in each scenario recognized the need to calculate the minimum requirements necessary to sustain their besieged garrisons. However, the Germans and the French refused to heed the warnings of their airlift commanders in the field. German airlift commanders at Stalingrad and French airlift commanders at Dienbienphu warned that these operations were unrealistic based on aircraft availability and enemy activity. Failure to heed these warnings resulted in disaster in both cases. In neither case were the airlifters able to supply more than half of the supplies required on a daily basis. Lack of adequate supplies severely impacted the garrisons' defense capabilities.

The U.S. possessed more airpower assets during Khe Sanh than the Germans and French at Stalingrad and Dienbienphu, respectively. Transport aircraft were available in sufficient numbers to deliver the minimum requirements on a daily basis. Other aircraft were available to harass the enemy and protect the transports. Even so, there were still days when deliveries were low. However, the flow of supplies never dropped so low that the garrison was in danger of being overrun.

Support and Defense Activities. Support and defense at Stalingrad,

Dienbienphu, and Khe Sanh was dependent upon a combination of location, supplies delivered, and air superiority. At Stalingrad, the Sixth Army was huddled in the ruins of the city. Russian air superiority and attacks on supporting airfields disrupted the delivery of adequate supplies to the German defenders. Lacking supplies, the German defensive perimeter was decreased on a daily basis. As the perimeter was reduced, airlift became more difficult, and even fewer supplies were delivered. The German pocket continued to shrink until finally, the airstrips were lost. This put an end to resupply efforts.

At Dienbienphu, the French failed to adequately defend their perimeter. They did not possess enough aircraft to suppress enemy anti-aircraft fire, and this resulted in loss of transport aircraft. The French allowed the enemy to set up gun emplacements on the surrounding hills which would allow the enemy to subject them to devastating artillery fire. Lack of supplies and the devastating artillery fire contributed to the loss of the airstrip at Dienbienphu on the second day of the battle. With the airstrip gone, there was no way to resupply the garrison other than by airdrop. Unfortunately for the French, the shrinking perimeter was too small for accurate delivery of supplies by this method. Without supplies, the garrison was doomed.

At Khe Sanh, the Marines did not allow the enemy to take command of the hills. Although the enemy did use the weather to set up positions near the airstrip, they were never able to completely subject it to devastating artillery or mortar fire. Ground attack aircraft consistently harassed enemy positions and destroyed their equipment and supply lines. This relieved some of the pressure on the garrison. Ground attack aircraft were also used to suppress anti-aircraft fire while the transports landed and took off. Having

adequate supplies, the Marines were able to maintain a large perimeter. Even when transports could not land, the perimeter was large enough for successful resupply by airdrop.

Intelligence Gathering. Intelligence reporting was a factor in each scenario. German intelligence failed to recognize the arrival of fresh Russian reinforcements of ground and air forces. This failure to understand the enemy's strength resulted in the decision to support Stalingrad by airlift. This decision may have been the turning point of the war.

The French failed to collect accurate intelligence reports. Navarre did not think that enemy forces would be able reach Dienbienphu before he could build a stronghold there. He also believed that the enemy would not be capable of transporting heavy artillery into the area. In reality, the enemy already had significant forces operating in the area. Again, the decision was made based on faulty information, and the resulting disaster had a heavy impact on the outcome of the war.

In contrast to German and French intelligence reporting, the U. S. provided accurate intelligence reporting on enemy troop movements and strengths in the Khe Sanh area. Accurate information allowed military leaders to make good decisions regarding which courses of action to follow.

Training. The importance of training was evident in each scenario. However, it did not seem to have a critical impact on the outcomes of Stalingrad or Dienbienphu. At Stalingrad, some attention was given to the fact that many of the airlift pilots were taken

straight out of flight schools. This seemed to cause few problems compared with all of the other problems that were developing.

At Dienbienphu, the French experienced a lack of trained maintenance personnel to sustain aircraft operations. This might have been a serious problem if the U.S. had not agreed to provide maintenance personnel to help out. As it turned out, training did not improve or hinder French chances for success.

Specialized training did improve the success of operations at Khe Sanh. Training on the LAPES and GPES systems allowed pilots to deliver supplies even when they could not actually land the aircraft. Special training allowed aircrews to successfully target enemy positions based on ground sensors. This alleviated some of the pressure on the garrison. Training on short takeoff and landing conditions proved useful in airlift operations at Khe Sanh.

Response to Political Considerations. The decisions to support Stalingrad, Dienbienphu, and Khe Sanh by airlift were all based on faulty political considerations. The Sixth Army could have probably escaped from Stalingrad, but Hitler refused to let them. He wanted to prove the invincibility of the German Army by holding, at all cost, the city bearing Stalin's name. The cost was the loss of the Sixth Army and the turning point of the war. When it was over, the Russians held Stalingrad.

The French wanted to come to grips with the enemy in a set piece battle. They believed that their technological superiority would crush the Vietminh in such a confrontation. They underestimated the enemy's ability to improvise, and allowed themselves to be drawn into an awkward position at Dienbienphu. For a brief period of

time, there was a chance to escape, but national pride got in the way. They did not believe that the army of a modern country such as France could be defeated by these technologically underdeveloped people. This mistake cost France the loss of the garrison at Dienbienphu and the loss of its empire in Southeast Asia.

The U.S. wanted to draw the NVA into a set piece battle where American firepower could be brought to bear against them. Khe Sanh provided an opportunity the opportunity to do this. The situation was similar to the French situation at Dienbienphu, but the U.S. was able to use its resources more efficiently. The garrison at Khe Sanh managed to survive until it was relieved, but there was no purpose in this display of military might. Shortly after the garrison was relieved, the site was abandoned. The U.S. paid a heavy price in manpower and equipment just to prove that it could sustain Khe Sanh by airlift.

Critical Elements

Historical analysis of Stalingrad, Dienbienphu, and Khe Sanh suggests that nine elements must be considered when attempting airlift operations. Table 4 indicates which elements were successfully or unsuccessfully employed in each scenario. The four key elements are denoted by an asterisk. The other elements are secondary.

Table 4. Comparison of Scenarios

<u>Issue</u>	<u>Degree of Success</u>		
	<u>Stalingrad</u>	<u>Dienbienphu</u>	<u>Khe Sanh</u>
Command and Control *	Unsuccessful	Unsuccessful	Successful
Use of Aircraft Availability/Capabilities *	Unsuccessful	Unsuccessful	Successful
Use of Technology	Marginally Successful	Marginally Successful	Successful
Ability to React to Location and Weather	Unsuccessful	Unsuccessful	Marginally Successful
Ability to Meet Logistical Requirements	Unsuccessful	Unsuccessful	Marginally Successful
Support and Defense * Activities	Unsuccessful	Unsuccessful	Successful
Intelligence Gathering *	Unsuccessful	Unsuccessful	Successful
Training	Marginally Successful	Marginally Successful	Successful
Response to Political Considerations	Unsuccessful	Unsuccessful	Marginally Successful to Unsuccessful

Each element has a definite role in the conduct of tactical military airlift operations. These elements are often interdependent. If all of these requirements are successfully employed, there will be a good probability of successful airlift operations. It

is safe to assume that disaster will follow if these requirements are ignored. The problem is determining which elements are crucial for success, and which are secondary.

The evidence suggests that only four of these elements can be considered crucial to the success of airlift operations. Failure in one of these areas could potentially cause the whole operation to fail. The key elements are command and control, aircraft availability/capabilities, support and defense, and intelligence gathering. It is not enough to recognize the need for these elements. They must be applied in a logical sequence.

Intelligence gathering seems to be the most logical place to begin. It makes sense that a leader should understand the location and strength of enemy forces before committing resources to tactical military airlift operations. Accurate intelligence may allow leaders to anticipate and disrupt enemy actions through the use of tactical military airlift. Regardless of the decision, it will be easier when accurate information is available.

The next element that must be considered is support and defense of the airlift site. Leadership must determine how large of an area they plan to support, the number of troops present, the types of weapons in use, and whether an airstrip is available. If an airstrip is available, leaders must consider its capacity to support airlift operations, and its vulnerability to enemy fire. If an airstrip is not available, leaders must evaluate whether the perimeter is large enough for successful airdrop operations or the use of systems such as LAPES or GPES.

Once the scenario is defined, minimum daily requirements can be calculated. The next logical consideration is aircraft availability/capabilities. Leaders must determine if there are sufficient numbers of aircraft available to deliver the minimum daily supply

requirements. They must also determine whether the airlift site is within the operational ranges of the aircraft employed to support it. Special airlift resources may be required, such as helicopters to deliver supplies to units geographically separated from the main base. Considerations will include availability of escort aircraft to protect the transports and ground attack aircraft to harass the enemy's positions.

Once the proper airpower package is determined, air operations should be placed under a single leader. Airlift operations at the airlift site should also be placed under the supervision of one leader. The purpose of this is to ensure smooth and coordinated airlift operations. These operations should be coordinated with ground attacks and anti-aircraft suppression. Properly employed, command and control will ensure that proper supplies are delivered, air space is not congested, downloads are conducted efficiently, and distribution of supplies is adequate for all units.

The other five elements improve the chances of success, but failure to consider them should not cause disaster. Nevertheless, their effects on the key elements should be considered. Technology could be a subset of any of the four critical elements. It could be used to improve command and control, aircraft availability/capabilities, support and defense, or intelligence reporting. Location and weather are factors that should be considered when determining aircraft availability/capabilities. Logistical requirements are derived from the unit size and weaponry employed at the airlift site. Realistic training can improve command and control channels, support and defense procedures, and intelligence reporting. Finally, political considerations may impact each of the four key elements. They may be most important in the support and defense of the airlift site. If political considerations are accepted as reasonable, morale may be better at the airlift site.

If political considerations are viewed as unrealistic, it could have a negative impact on morale, and success, at the airlift site.

Future Application

Analysis of tactical military airlift operations at Stalingrad, Dienbienphu, and Khe Sanh indicates that there are nine elements involved in tactical military airlift. The key elements required for success are intelligence reporting, support and defense, aircraft availability/capabilities, and command and control. The other five elements, technology, location and weather, logistical requirements, training, and political considerations, serve to enhance or hinder the key elements.

These elements of tactical military airlift appear simple, but the historical scenarios discussed indicate that their successful application is not easily or automatically achieved. As the United States moves toward CONUS-based airpower and faces the possibility of simultaneous operations in regions lacking American military infrastructure, it is logical to assume that tactical military airlift will grow in importance. Unfortunately, tactical military airlift is an area that has not received much scholarly attention. The requirements, due to troop strengths and weaponry, are different for each scenario. Most researchers stop when they realize that they cannot develop a standard formula that can be applied to each scenario.

With the expected growth of tactical military airlift operations in the future, the time has come to develop positive doctrine. Efforts must be intensified to upgrade aircraft for this role. This thesis provides a starting point for discussions on the theory of tactical military airlift and the elements involved in it. It builds a pattern for recognizing and describing similar situations in the future. Theoretical discussions and considerations

of the elements identified may lead to the development of procedures that can be successfully applied to tactical military airlift operations in the future.

BIBLIOGRAPHY

- Armitage, M. J., and R. A. Mason, 1985. *Air Power In The Nuclear Age* (2d ed.). Chicago IL: University of Illinois Press.
- Boog, Horst. 1978. Higher command and leadership in the German Luftwaffe. In A. F. Hurley & R. C. Ehrhart (Eds.), *Air Power and Warfare: The Proceedings of the 8th Military History Symposium*:128-158. Washington: Office of Air Force History and the U.S. Air Force Academy.
- Bowers, Ray L. 1978. Air operations in Southeast Asia: a tentative appraisal. In A. F. Hurley & R. C. Ehrhart (Eds.), *Air Power and Warfare: The Proceedings of the 8th Military History Symposium*: 309-329. Washington: Office of Air Force History and the U.S. Air Force Academy.
- Clausewitz, Carl. 1976. *On War*. New Jersey: Princeton University Press.
- Davidson, Phillip B. 1988. *Vietnam At War*. Novato CA: Presidio Press.
- Dyche, David D. 1995. *Making Operational Support Airlift Ready For War*. Maxwell Air Force Base AL: Air University Press.
- Garden, Timothy. 1986. The Air-Land Battle. In R. A. Mason (Ed.), *War in the Third Dimension: Essays in Contemporary Air Power*: 149-167. New York: Brassey's Defence Publishers.
- Giap, Vo-Nguyen. 1964. *Dien Bien Phu*. Hanoi: Foreign Languages Publishing House.
- Gurtov, Melvin. 1967. *The First Vietnam Crisis: Chinese Communist Strategy and United States Involvement, 1953-1954*. New York: Columbia University Press.
- Hayward, J. S. A. 1997. "Stalingrad: an examination of Hitler's decision to airlift." *Air Chronicles*. Maxwell Air Force Base AL: Air University Press.
- Jablonski, Edward. 1971. *Airwar*. New York: Doubleday & Company, Inc.
- Jukes, Geoffrey. 1985. *Hitler's Stalingrad Decisions*. Los Angeles CA: University of California Press.

- Kerr, Walter. 1978. *The Secret of Stalingrad*. New York: Doubleday & Company, Inc.
- Looney, William R. III. 1997. "The Air Expeditionary Force: Taking the Air Force into the Twenty-First Century". *Air Chronicles*. Maxwell Air Force Base AL: Air University Press.
- Mason, H. M. Jr. 1973. *The Rise of The Luftwaffe*. New York: The Dial Press.
- Miller, C.E. 1988. *Airlift Doctrine*. Maxwell Air Force Base AL: Air University Press.
- Milton, T.R. 1978. From the Berlin airlift to Vietnam and beyond: a participants view. In A. F. Hurley and R. C. Ehrhart (Eds.), *Air Power and Warfare: The Proceedings of the 8th Military History Symposium*: 300-308. Washington: Office of Air Force History and the U.S. Air Force Academy.
- Morse, Daniel P. Jr. 1990. *The History of the 50th Aero Squadron: The "Dutch Girl" Observation Squadron in World War I* (2d ed.). Nashville: The Battery Press.
- Prados, J., and R. W. Stubbe, 1991. *Valley of Decision: The Siege of Khe Sanh*. New York: Houghton Mifflin Company.
- Roy, Jules. 1965. *The Battle of Dienbienphu*. New York: Harper & Row.
- Shore, Moyers S. II. 1969. *The Battle For Khe Sanh*. Washington DC: U.S. Government Printing Office.
- Skorupa, John A. 1989. *Self-Protective Measures to Enhance Airlift Operations in Hostile Environments*. Maxwell Air Force Base AL: Air University Press.
- Whiting, Kenneth R. 1978. Soviet air power in World War II. In A. F. Hurley and R. C. Ehrhart (Eds.), *Air Power and Warfare: The Proceedings of the 8th Military History Symposium*: 98-127. Washington: Office of Air Force History and the U.S. Air Force Academy.

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13. ABSTRACT (Maximum 200 Words) This study examines tactical military airlift operations conducted during three historical battles – Stalingrad, Dienbienphu, and Khe Sanh. Aspects of tactical military airlift operations are identified from these scenarios. The list of important issues that results can be considered when employing tactical military airlift in the future. Using inductive reasoning, tactical military airlift operations in each scenario, and their success or failure, are examined to develop a pattern for recognizing and describing similar situations in the future. Experiences at Stalingrad, Dienbienphu, and Khe Sanh indicated that there are nine elements that should be considered when employing tactical military airlift. Those elements are command and control, aircraft availability and capabilities, technology, location and weather, logistical requirements, support and defense intelligence gathering, training, and political considerations. Command and control, aircraft availability and capabilities, support and defense, and intelligence gathering are identified as crucial elements for success in tactical military airlift operations. The remaining five elements may have an impact on the crucial elements. Historical experience at Stalingrad, Dienbienphu, and Khe Sanh indicate that successful application of simple concepts is not automatically achieved. Recognition of the crucial elements and their secondary elements is important to the future of tactical military airlift operations.				
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